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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/282,907 03/31/99 CHAO

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EXAMINER

TM02/0925

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ELEURANTIN, J

ART UNIT

PAPER NUMBER

2172
DATE MAILED:

09/25/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
09/282,907

Applicant(s)
Ching-Yun Chao et al.

Examiner
Jean Bolte Fleurantin

Art Unit
2172



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE three MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on Jul 23, 2001
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above, claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- a) ☐ All b) ☐ Some* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- *See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

- 15) ☐ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). _____
- 18) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other:

Art Unit: 2172

DETAILED ACTION

Response to Amendment

1. Claims 26-30 are canceled.

Claims 1-25 are remained for examination.

2. Applicant's arguments submitted on July 31, 2001 on pages 2 through 18 with respect to claims 1, 9, 15, and 21 have been fully considered but they are not persuasive.

Response to Applicant's remarks

3. As per claims 1, 9, 15, and 21 Applicant argues that the San Andres reference does not teach or suggest:

In response to applicant's argument on pages 2-3 that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, San Andres provides user access to service content data that is updated by the on line service on a transaction by transaction basis, and permits users to read and download messages for review by other users, see col 1, lines 38-43.

Applicant stated on page 6 that "each node in the computer cluster voting based on a functional outcome of the database update request". However, Examiner disagrees because San

Art Unit: 2172

Andres strongly suggest the step of the arbiter monitors the outcome of the transaction on each server by checking the status codes returned by the servers, when one server of the service group processes the dispatched transaction differently than the other servers the arbiter uses a voting scheme to decide which server or servers are to be taken off line service group, the arbiter uses a majority rules voting scheme under the majority rules scheme, if the majority number servers of the service group report a different outcome than others servers the majority servers are treated as being inconsistent with final outcome and taken off line; which is read as each node in the computer cluster voting based on a functional outcome of the database update request (see col. 19, lines 44-55). Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the teaching of San Andres with the step of each node in the computer cluster voting based on a functional outcome of the database update request. This modification would allow the teachings of San Andres to improve the accuracy and reliability of the error detection protocol.

In response to applicant's argument on page 6 that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Art Unit: 2172

Applicant stated on pages 9 and 15 that “voting, by all of the other nodes in the computer cluster, to approve update if a match results from the comparison”. However, Examiner disagrees because San Andres includes the step of the whenever the arbiter replicates a transaction the arbiter monitors the outcome of the transaction on each server of the service group to ensure consistent processing of the transaction by all such servers, when one or more servers indicates a different outcome than the other servers of the service group the arbiter uses a voting scheme to resolve the conflict between the servers a preferred voting scheme is described below under the heading status codes and conflict resolution; which is read as voting, by all of the other nodes in the computer cluster, to approve update if a match results from the comparison (see col. 17, lines 10-19).

Examiner is entitled to give claim limitations their broadest reasonable interpretation in light of the specification.

Interpretation of Claims-Broadest Reasonable Interpretation

During patent examination, the pending claims must be ‘given the broadest reasonable interpretation consistent with the specification.’ Applicant always has the opportunity to amend the claims during prosecution and broad interpretation by the examiner reduces the possibility that the claim, once issued, will be interpreted more broadly than is justified. In re Prater, 162 USPQ 541,550-51 (CCPA 1969).

Art Unit: 2172

Claim Rejections - 35 U.S.C. § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-30 are rejected under 35 U.S.C. 103 (a) as being unpatentable over San Andres et al. (US Pat. No. 5,956,489).

As per claim 1, San Andres substantially teaches a method for maintaining a consistent set of replicas of a database within a computer cluster (thus, enabling each application server to maintain a replicated copy of service content data, which is readable as maintaining a consistent set of replicas of a database within a computer cluster) (see abstract, lines 5-6) as claimed comprises the steps of each node in the computer cluster receiving a database update request (thus, once the content of the application server is brought up to date the application server is placed in a state which allows it to receive client request, which is readable as each node in the computer cluster receiving a database update request)(see col. 3, lines 8-11, 26-30);

detecting an out-of-sync condition as a result of a different functional outcome (thus, when different application servers of a service group process the same update transaction differently the arbiter resolves the conflict by determining the final outcome of the transaction for the service group as whole and taking by any application servers off line that are in conflict with this final outcome, which is readable as detecting an out-of-sync condition as a result of a

Art Unit: 2172

different functional outcome) (see col. 2, lines 55-60). But, San Andres explicitly does not indicate the step of each node in the computer cluster voting based on a functional outcome of the database update request. However, San Andres suggest the step of the arbiter monitors the outcome of the transaction on each server by checking the status codes returned by the servers, when one server of the service group processes the dispatched transaction differently than the other servers the arbiter uses a voting scheme to decide which server or servers are to be taken off line service group, the arbiter uses a majority rules voting scheme under the majority rules scheme, if the majority number servers of the service group report a different outcome than others servers the majority servers are treated as being inconsistent with final outcome and taken off line; which is readable as each node in the computer cluster voting based on a functional outcome of the database update request (see col. 19, lines 43-55). It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the teaching of San Andres with the step of each node in the computer cluster voting based on a functional outcome of the database update request. This modification would allow the teachings of San Andres to provide access to identical data and so that the on line service appears the same to all end users (col. 1, lines 61-61).

As per claim 2, San Andres substantially teaches a method as claimed, wherein the out-of-sync condition is an error (thus, the arbiter uses a majority rules voting scheme under the majority rules scheme, if the majority number servers of the service group report a different outcome than others servers the majority servers are treated as being inconsistent with final

Art Unit: 2172

outcome and taken off line; which is readable as wherein the out-of-sync condition is an error) (see col. 19, lines 18-55).

As per claim 3, San Andres substantially teaches a method as claimed, further comprises the step of: refreshing the database in response to the detecting step (thus, when an application server of a service group receives a client request that indicates a modification to replicated service content data the server generates an update transaction and sends the update transaction to the arbiter, which is readable as refreshing the database in response to the detecting) (see col. 3, lines 26-30).

As per claim 4, San Andres substantially teaches a method as claimed, further comprises the step of: resetting cluster membership in response to the detecting step (thus, when an application server of a service group receives a client request that indicates a modification to replicated service content data the server generates an update transaction and sends the update transaction to the arbiter, which is readable as resetting cluster membership in response to the detecting (see col. 3, lines 26-30).

As per claim 5, San Andres substantially teaches a method as claimed, further comprises the step of blocking further participation by the node having the out-of-sync condition in response to the detecting step (thus, when different application servers of a service group process the same update transaction differently the arbiter resolves the conflict by determining the final outcome of the transaction for the service group as whole and taking by any application servers

Art Unit: 2172

off line that are in conflict with this final outcome, which is readable as participation by the node having the out-of-sync condition in response to the detecting step (see col. 2, lines 55-60).

As per claim 6, San Andres substantially teaches a method as claimed, further comprises the step of: declaring an end-of-transaction state on update voting completion when the database update is being done in a transactional manner (thus, servers receive the update transaction from arbiter respond by processing the update transaction and returning a status code that indicates the success or failure, which is equivalent to declaring an end-of-transaction state on update voting completion when the database update is being done in a transactional manner) (see col. 19, lines 25-28).

As per claim 7, San Andres substantially teaches a method as claimed, further comprising the step of backing out an update when update voting does not meet a criteria established for success (thus, servers receive the update transaction from arbiter respond by processing the update transaction and returning a status code that indicates the success or failure, which is readable as backing out an update when update voting does not meet a criteria established for success) (see col. 19, lines 25-28).

As per claim 8, San Andres substantially teaches a method as claimed, wherein the criteria established for success is that no more than one node has inconsistent results (see col. 2, lines 55-64).

As per claim 9, in addition to the discussion in claim 1, San Andres teaches a method for maintaining a consistent set of replicas of a database within a computer cluster (see col. 1, lines

Art Unit: 2172

60-61) as claimed, comprises the steps of: broadcasting an update to a database shared among a plurality of nodes in the computer cluster (thus, the arbiter records the update transaction in a service group specific transaction log and forwards the transaction for immediate processing to every application server in the group, which is equivalent to broadcasting an update to a database shared among a plurality of nodes in the computer cluster) (see col. 3, lines 30-34);

applying the update to a local copy of the database at each of the plurality of nodes in the computer cluster (thus, all duplicated servers of the service group maintain local copies of the service's content data and provide user access to such data, which is readable as applying the update to a local copy of the database at each of the plurality of nodes in the computer cluster) (see col. 9, lines 19-21);

comparing, by all of the other nodes in the computer cluster, the update results to results of application of the update to the local copy of the database (thus, a conflict resolution feature for resolving transaction processing conflicts between application servers, when different application servers of a service group process the same update transaction differently the arbiter resolves the conflict by determining the final outcome of the transaction for the service group as whole and taking by any application servers off line that are in conflict with this final outcome, which is readable as comparing, by all of the other nodes in the computer cluster, the update results to results of application of the update to the local copy of the database) (see col. 2, lines 53-60). But, San Andres explicitly does not indicate the step of the voting, by all of the other nodes in the computer cluster to approve update if a match results from the comparison.

Art Unit: 2172

However, San Andres shows implicitly the step of the whenever the arbiter replicates a transaction the arbiter monitors the outcome of the transaction on each server of the service group to ensure consistent processing of the transaction by all such servers, when one or more servers indicates a different outcome than the other servers of the service group the arbiter uses a voting scheme to resolve the conflict between the servers a preferred voting scheme is described below under the heading status codes and conflict resolution; which is read as voting, by all of the other nodes in the computer cluster to approve update if a match results from the comparison (see col. 17, lines 10-19). Thus, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the teaching of San Andres with the step of voting, by all of the other nodes in the computer cluster to approve update if a match results from the comparison. This modification would allow the teachings of San Andres to improve the accuracy and the reliability of the error detection protocol.

As per claims 10 and 16, San Andres substantially teaches a method as claimed, further comprising the step of: voting, by any one of the other nodes in the computer cluster, to continue with update process if a match does not result from the comparison (thus, when inconsistent transaction results are reported by different application servers the transaction replication service uses a voting scheme to decide which application servers are to be deemed 'consistent'; which is readable as voting, by any one of the other nodes in the computer cluster, to continue with update process if a match does not result from the comparison) (see abstract, lines 10-14).

Art Unit: 2172

As per claims 11, 17, and 22 San Andres substantially teaches a method as claimed, further comprising the step of broadcasting an approval of the update to the database if all of the other nodes vote to approve the update (thus, when a new application server is brought on line previously dispatched update transactions stored in the transaction log are dispatched in sequence to the new server to bring the new server's content data up to date, which is readable as broadcasting an approval of the update to the database if all of the other nodes vote to approve the update) (see abstract, lines 16-20).

As per claims 12, 18, and 23 San Andres substantially teaches a method as claimed, further comprises the step of if more than one of the plurality of nodes votes to continue, performing a recovery process (see abstract, lines 11-13).

As per claims 13, 19, and 24 San Andres substantially teaches a method as claimed, wherein the recovery process further comprises the step of if more than a specified number of the nodes voted to continue, backing out the update to the database (see col 20, lines 26-42).

As per claims 14 and 20, San Andres substantially teaches a method as claimed 14. The method as recited in claim 12, wherein the recovery process further comprises the step of: if less than a specified number of the nodes voted to continue, performing the recovery process on the specified number of the nodes (see col. 17, lines 10-19).

As per claim 15, in addition to the discussion in claims 1 and 9, San Andres substantially teaches a computer cluster operable for maintaining a consistent set of replicas of a database within the computer cluster as claimed, comprises: a group services client operable for

Art Unit: 2172

broadcasting an update to a database shared among a plurality of nodes in the computer cluster (thus, architecture of on line services network in which a preferred embodiment of a transaction replication system and method are employed, which is readable as a group services client operable for broadcasting an update to a database shared among a plurality of nodes in the computer cluster) (see figure 1, col. 3, lines 50-53);

the plurality of nodes coupled to the computer cluster operable for applying the update to a local copy of the database at each of the plurality of nodes in the computer cluster (thus, a conflict resolution feature for resolving transaction processing conflicts between application servers, when different application servers of a service group process the same update transaction differently the arbiter resolves the conflict by determining the final outcome of the transaction for the service group as whole and taking by any application servers off line that are in conflict with this final outcome, which is readable as the plurality of nodes coupled to the computer cluster operable for applying the update to a local copy of the database at each of the plurality of nodes in the computer cluster) (see col. 2, lines 53-60).

As per claim 21, in addition to the discussion in claim 9, San Andres substantially teaches a computer program product adaptable for storage on a computer readable medium, the computer program product operable for maintaining a consistent set of replicas of a database within a computer cluster as claimed, comprises the program steps of voting, by any one if the other nodes in the computer cluster, to continue with update process if a match does not result from the comparison (the transaction replication service uses a voting scheme to decide which application

Art Unit: 2172

servers are to be deemed 'consistent'; which is readable as voting, by any one if the other nodes in the computer cluster, to continue with update process if a match does not result from the comparison) (see abstract, lines 11-13).

As per claim 25, San Andres substantially teaches a computer program product as claimed, wherein the recovery process further comprises the program step of if less than a specified number of the nodes voted to continue, performing the recovery process on the specified number of the nodes (see col. 17, lines 10-19).

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Jain et al. US Patent Number 5,737,601 relates to the field of data replication.

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CAR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CAR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Art Unit: 2172

Conclusion

7. Any inquiry concerning this communication from examiner should be directed to Jean Bolte Fleurantin at (703) 308-6718. The examiner can normally be reached on Monday to Friday from 7:30 A.M. to 6.00 P.M.

If any attempt to reach the examiner by telephone is unsuccessful, the examiner's supervisor, Mrs. KIM VU can be reached at (703) 305-8449. The FAX phone number is (703) 305-9731.

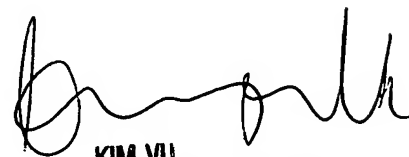
Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone is (703) 305-9600.



Jean Bolte Fleurantin

September 19, 2001

JBf/



KIM VU
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